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(54) **ARTICLE HAVING TRANSPARENT CONDUCTIVE OXIDE THIN FILM AND ITS PRODUCTION**

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain an oxide film having excellent transmitting property for blue light while reducing the amt. of In_2O_3 which is a scarce mineral resource by using an oxide having a specified compsn. of Zn, Al and Ba, In as a target and specifying the substrate temp. and pressure. SOLUTION: An oxide expressed by the general formula of $\text{Zn}_x\text{M}_y\text{In}_z\text{O}(x+3y/2+3z/2)$ is used as a target to form an oxide film by sputtering or laser ablation method under the conditions of from room temp. to 300°C substrate temp. and 1×10^{-2} to 10 (Pa) pressure. In the formula, M is at least one element of Al and Ga, the proportion x/y ranges 0.2 to 12, the proportion z/y ranges 0.4 to 1.4. The conductivity of the oxide of the target is good when the carrier electron density in the conductive band ranges about 1×10^{18} to $1 \times 10^{22}/\text{cm}^3$. By injecting actions to the oxide, carrier electrons are injected to the conductive band to develop the conductivity.